

WHAT IS CLAIMED IS:

1. A suspension comprising:

a resilient flexure for supporting a head slider having at least one head element to control flying attitude of said head slider;

a load beam, supporting said flexure at its top end section, for applying a load in a direction perpendicular to a surface of a recording medium to said head slider;

at least one fixing means, formed integral with said load beam, for fixing said load beam to a support arm; and

a load-generation means, coupling said at least one fixing means with said load beam, for generating the load,

said load-generation means having first at least one leaf spring section formed in a three-dimensionally bent shape and integral with said load beam, said first at least one leaf spring section being located at the rear of said at least one fixing means.

2. A head gimbal assembly comprising:

a head slider having at least one head element;

a resilient flexure for supporting said head slider to control flying attitude of said head slider;

a load beam, supporting said flexure at its top end section, for applying a load in a direction perpendicular to a surface of a recording medium to said head slider;

at least one fixing means, formed integral with said load beam, for fixing said load beam to a support arm; and

a load-generation means, coupling said at least one fixing means with said load beam, for generating the load,

said load-generation means having first at least one leaf spring section formed in a three-dimensionally bent shape and integral with said load beam, said first at least one leaf spring section being located at the rear of said at least one fixing means.

3. The head gimbal assembly as claimed in claim 2, wherein said first at least one leaf spring section and said load beam are unitarily formed by a single plate member.

4. The head gimbal assembly as claimed in claim 2, wherein said first at least one leaf spring section and said load beam are formed by coupling in integral individual plate members.

5. The head gimbal assembly as claimed in claim 2, wherein said first at least one leaf spring section is located at the rear of a center of an unprung mass of said head gimbal assembly except for said head slider.

6. The head gimbal assembly as claimed in claim 2, wherein said first at least one leaf spring section is formed by a

single leaf spring section.

7. The head gimbal assembly as claimed in claim 2, wherein said first at least one leaf spring section is formed by a plurality of leaf spring sections.

8. The head gimbal assembly as claimed in claim 2, wherein said head gimbal assembly further comprises second at least one leaf spring section, formed at the rear of said first at least one leaf spring section along an axis of said head gimbal assembly, for restraining displacement of a rear end section of said load beam, and wherein said at least one fixing means comprises first at least one fixing means coupled with said first at least one leaf spring section and second at least one fixing means coupled with said second at least one leaf spring section.

9. The head gimbal assembly as claimed in claim 8, wherein said second at least one leaf spring section is formed in a three-dimensionally bent shape and integral with said load beam, and wherein said second at least one leaf spring section is located at the rear of said second at least one fixing means.

10. The head gimbal assembly as claimed in claim 8, wherein

said first at least one fixing means and said second at least one fixing means are the same fixing part.

11. The head gimbal assembly as claimed in claim 8, wherein said first at least one fixing means and said second at least one fixing means are different fixing parts located at different positions with each other.

12. The head gimbal assembly as claimed in claim 8, wherein said second at least one leaf spring section is formed by a single leaf spring section.

13. The head gimbal assembly as claimed in claim 8, wherein said second at least one leaf spring section is formed by a plurality of leaf spring sections.

14. The head gimbal assembly as claimed in claim 2, wherein said at least one head element comprises at least one thin-film magnetic head.

15. A head arm assembly comprising:  
a head slider having at least one head element;  
a resilient flexure for supporting said head slider to control flying attitude of said head slider;  
a load beam, supporting said flexure at its top end

section, for applying a load in a direction perpendicular to a surface of a recording medium to said head slider;

at least one fixing means formed integral with said load beam;

a load-generation means, coupling said at least one fixing means with said load beam, for generating the load;

a high rigid support arm fixed to said at least one fixing means at its top end section for supporting said load beam; and

a drive means for rotationally moving the support arm in a direction parallel to said surface of the recording medium,

said load-generation means having first at least one leaf spring section formed in a three-dimensionally bent shape and integral with said load beam, said first at least one leaf spring section being located at the rear of said at least one fixing means.

16. The head arm assembly as claimed in claim 15, wherein said first at least one leaf spring section and said load beam are unitarily formed by a single plate member.

17. The head arm assembly as claimed in claim 15, wherein said first at least one leaf spring section and said load beam are formed by coupling in integral individual plate members.

18. The head arm assembly as claimed in claim 15, wherein said first at least one leaf spring section is located at the rear of a center of an unprung mass of said head gimbal assembly except for said head slider.

19. The head arm assembly as claimed in claim 15, wherein said first at least one leaf spring section is formed by a single leaf spring section.

20. The head arm assembly as claimed in claim 15, wherein said first at least one leaf spring section is formed by a plurality of leaf spring sections.

21. The head arm assembly as claimed in claim 15, wherein said head gimbal assembly further comprises second at least one leaf spring section, formed at the rear of said first at least one leaf spring section along an axis of said head gimbal assembly, for restraining displacement of a rear end section of said load beam, and wherein said at least one fixing means comprises first at least one fixing means coupled with said first at least one leaf spring section and second at least one fixing means coupled with said second at least one leaf spring section.

22. The head arm assembly as claimed in claim 21, wherein said second at least one leaf spring section is formed in a three-dimensionally bent shape and integral with said load beam, and wherein said second at least one leaf spring section is located at the rear of said second at least one fixing means.

23. The head arm assembly as claimed in claim 21, wherein said first at least one fixing means and said second at least one fixing means are the same fixing part.

24. The head arm assembly as claimed in claim 21, wherein said first at least one fixing means and said second at least one fixing means are different fixing parts located at different positions with each other.

25. The head arm assembly as claimed in claim 21, wherein said second at least one leaf spring section is formed by a single leaf spring section.

26. The head arm assembly as claimed in claim 21, wherein said second at least one leaf spring section is formed by a plurality of leaf spring sections.

27. The head arm assembly as claimed in claim 15, wherein

said at least one head element comprises at least one thin-film magnetic head.

28. A head arm assembly comprising:

a head slider having at least one head element;

a resilient flexure for supporting said head slider to control flying attitude of said head slider;

a load beam, supporting said flexure at its top end section, for applying a load in a direction perpendicular to a surface of a recording medium to said head slider;

at least one fixing means formed integral with said load beam;

a load-generation means, coupling said at least one fixing means with said load beam, for generating the load;

a high rigid support arm fixed to said at least one fixing means at its top end section for supporting said load beam; and

a drive means for rotationally moving the support arm in a direction parallel to said surface of the recording medium,

said load-generation means having first at least one leaf spring section located at the rear of said at least one fixing means and at the front of a horizontal bearing axis of the support arm, which is driven to rotationally move around the horizontal bearing axis.



29. The head arm assembly as claimed in claim 28, wherein said first at least one leaf spring section and said load beam are unitarily formed by a single plate member.

30. The head arm assembly as claimed in claim 28, wherein said first at least one leaf spring section and said load beam are formed by coupling in integral individual plate members.

31. The head arm assembly as claimed in claim 28, wherein said first at least one leaf spring section is located at the rear of a center of an unprung mass of said head gimbal assembly except for said head slider.

32. The head arm assembly as claimed in claim 28, wherein said first at least one leaf spring section is formed by a single leaf spring section.

33. The head arm assembly as claimed in claim 28, wherein said first at least one leaf spring section is formed by a plurality of leaf spring sections.

34. The head arm assembly as claimed in claim 28, wherein said head gimbal assembly further comprises second at least one leaf spring section, formed at the rear of said first at

least one leaf spring section along an axis of said head gimbal assembly, for restraining displacement of a rear end section of said load beam, and wherein said at least one fixing means comprises first at least one fixing means coupled with said first at least one leaf spring section and second at least one fixing means coupled with said second at least one leaf spring section.

35. The head arm assembly as claimed in claim 34, wherein said second at least one leaf spring section is formed in a three-dimensionally bent shape and integral with said load beam, and wherein said second at least one leaf spring section is located at the rear of said second at least one fixing means.

36. The head arm assembly as claimed in claim 34, wherein said first at least one fixing means and said second at least one fixing means are the same fixing part.

37. The head arm assembly as claimed in claim 34, wherein said first at least one fixing means and said second at least one fixing means are different fixing parts located at different positions with each other.

38. The head arm assembly as claimed in claim 34, wherein

said second at least one leaf spring section is formed by a single leaf spring section.

39. The head arm assembly as claimed in claim 34, wherein said second at least one leaf spring section is formed by a plurality of leaf spring sections.

40. The head arm assembly as claimed in claim 28, wherein said at least one head element comprises at least one thin-film magnetic head.

41. A disk drive device including at least one recording medium and at least one head arm assembly that comprises:

- a head slider having at least one head element;
- a resilient flexure for supporting said head slider to control flying attitude of said head slider;
- a load beam, supporting said flexure at its top end section, for applying a load in a direction perpendicular to a surface of a recording medium to said head slider;
- at least one fixing means formed integral with said load beam;
- a load-generation means, coupling said at least one fixing means with said load beam, for generating the load;
- a high rigid support arm fixed to said at least one fixing means at its top end section for supporting said load

beam; and

a drive means for rotationally moving the support arm in a direction parallel to said surface of the recording medium,

said load-generation means having first at least one leaf spring section formed in a three-dimensionally bent shape and integral with said load beam, said first at least one leaf spring section being located at the rear of said at least one fixing means.

42. A disk drive device including at least one recording medium and at least one head arm assembly that comprises:

a head slider having at least one head element;

a resilient flexure for supporting said head slider to control flying attitude of said head slider;

a load beam, supporting said flexure at its top end section, for applying a load in a direction perpendicular to a surface of a recording medium to said head slider;

at least one fixing means formed integral with said load beam;

a load-generation means, coupling said at least one fixing means with said load beam, for generating the load;

a high rigid support arm fixed to said at least one fixing means at its top end section for supporting said load beam; and

a drive means for rotationally moving the support arm in a direction parallel to said surface of the recording medium,

said load-generation means having first at least one leaf spring section located at the rear of said at least one fixing means and at the front of a horizontal bearing axis of the support arm, which is driven to rotationally move around the horizontal bearing axis.